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XLVIII.—INDIAN SPECIES OF IMPATIENS.

On some Western Peninsular Indian Balsamineae collected by Mr. A. Meebold.

J. D. Hooker.

In *Kew Bulletin*, 1910, p. 291 et seq., I described a considerable number of Indian *Impatiens* for the most part collected by Mr. Meebold* in 1908, of which seven were from the Western Peninsula, especially from the Western Ghat and Mysore. Encouraged by the publication of these new and interesting species, Mr. Meebold in a subsequent Western Peninsular journey (1910) paid special attention to the *Impatiens* which he met with. On this occasion the countries visited were the Nilgiri Hills, Cochin and Travancore, and the collection of Balsams was sent to me for study and transmission to the Herbarium of Breslau, with permission to retain any duplicates for that of Kew. On examination I found the collection to consist of 21 species under 44 numbers. Of those the following six may I think be regarded as hitherto undescribed; of these three *I. herbicola*, *I. rivulicola* and *I. pallidiflora*, all from Travancore, differ from the widely distributed *I. chinensis* chiefly in the remarkably small flowers, capsules and seeds.

Conspectus of Species described.

Inflorescentia simpliciter pedicellata :—
  Folia omnia opposita, sepala 2 anguste linearia, labelli limbum aequantia :—
    Alae bilobae :—
      Labellum ecalcaratum ... ... 1. *I. herbicola.*
      Labellum calcaratum ... ... 2. *I. rivulicola.*
    Alae simplices; lobus basalis minimus ... 3. *I. pallidiflora.*
  Folia superiora verticillata; sepala brevissima :—
    Labelli calcar limbo paullo brevius ... 4. *I. macrocarpa.*
    Labelli calcar limbo multo longius ... 5. *I. cochinica.*
Inflorescentia pedunculata; pedunculi 2–4-flori ... 6. *I. verecunda.*

* Mr. Meebold's Indian researches are, I believe, in the main ethnological.

(21652—6a.) Wt. 118—9. 1125. 11/11. D & S.

1. I. herbicola, *Hk. f.*; sp. nov.; herba gracilis *I. chinensi*, L., affinis, differt foliis anguste linearibus 2–3 mm. latis integerrimis, floribus minutis, labello angusto ecalcarato capsulisque parvis oligospermis.

Herba glaberrima, 4–6 dm. alta, minutiflora, caule erecto terete parce ramoso, ramis erectis, internodiis elongatis. *Folia* 5–6 cm. longa, opposita, sessilia vel brevissime petiolata, coriacea, anguste linearia, acuminata, integerrima, basi truncata vel cordata; glandulae infrapetiolares minutae, subulatae vel pulvinatae, vel 0. *Inflorescentia* simpliciter pedicellata; pedicelli solitarii vel 2–3-ni, florentes 0·5–1 cm. longi, fructiferi 2–3 cm. longi, erecti vel patuli. *Flores* 5–6 mm. expansi, albi. *Sepala* 2, linearia, acuminata, 4–5 mm. longa, uninervia. *Vexillum* orbiculare, 4 mm. latum, recurvum, costa dorso crasse carinata, apiculata. *Alae* stipitatae, 7–8 mm. longae; lobus basalis parvus, oblongus, suberectus; distalis rotundatus vel semilunaris; auricula dorsalis prominens. *Labelli* limbus scaphiformis, lanceolatus, 4–5 mm. longus, horizontalis, ecalcaratus vel imo basi subtus gibbo instructus. *Filamenta* subulata. *Ovarium* ovoideum. *Capsulae* parvae, gibbosim ovoideae, turgidae, 0·7–1 cm. longae, stipitatae, acute rostratae, oligospermae. *Semina* rotundata, compressa, 2–5 mm. diametro, nitida, atra.

Travancore. Udambanshola: in the grass, 1525 m., *A. Meebold*, 1311; Pecamode, 1372 m., *A. Meebold*, 12,924.

2. I. rivulicola, *Hk. f.*; sp. nov.; *I. chinensi*, L., affinis, differt foliis angustioribus, floribus parvis, labelli calcare limbo breviore capsulisque 0·8–1 cm. longis oligospermis seminibus minutis.

Herba gracilis, 2–3 dm. alta, glaberrima, parviflora, caule simplici tetragono, internodiis elongatis. *Folia* opposita, 3–4 cm. longa, brevissime petiolata, coriacea, linearia, acuta vel acuminata, integerrima vel remote minute spinuloso-serrulata, basi cordata, subtus pallida, nervis utrinque 3–4; glandulae infrapetiolares subulatae. *Inflorescentia* simpliciter pedicellata; pedicelli solitarii vel 2–3-ni, florentes 1–1·5 cm. longi, fructiferi 2–2·5 cm. longi, deflexi. *Flores* expansi 0·5–1 cm. longii exsiccat, violacei, lobo distali alarum flavido. *Sepala* 2, anguste linearia, acuminata, 1 cm. longa. *Vexillum* parvum, orbiculare, costa dorso carinata, mutica. *Alae* 1–1·6 cm. longae, late stipitatae; lobus basalis parvus, oblongus, rectus vel decurvus, distalis semilunaris, crassiusculus; auricula dorsalis parva. *Labellum* cymbiforme, acutum; calcar limbo brevius, incurvum. *Filamenta* brevia. *Capsulae* parvae, 0·8–1 cm. longae, pendulae, sessiles, ovoideae, acuminatae, oligospermae. *Semina* orbicularia, vix 2 mm. diametro, atra, nitida.

Travancore. Puriar Valley: borders of streams, 1220 m., *A. Meebold*, 13,755.

3. I. pallidiflora, *Hk. f.*; sp. nov.; *I. chinensi*, L., affinis, differt ramulis saepe pubescentibus, floribus multo minoribus, alis longe stipitatis, lobo basali minimo vel 0 et labelli calcare brevi.

Herba gracilis, 3–5 dm. alta, floribus inter minores, caule erecto subsimplici, ramulis saepe pubescentibus internodiis elongatis. *Folia* 3–5 cm. longa, opposita, breviter petiolata, firma, oblonga vel lineari-oblonga, acuta vel acuminata, integerrima vel minute spinuloso-serrulata, basi truncata vel rotundata, utrinque glabra vel

puberula, subtus pallida fere glauca, petiolo 1–2 mm. longo, nervis utrinque 2–4; glandulae infrapetiolares 0 vel setaceae. *Inflorescentia* simpliciter pedicellata; pedicelli solitarii, florentes foliis breviores, graciles, erecti, glabri vel puberuli, fructiferi foliis longiores. *Flores* ad 2 cm. expansi, rosei, exsiccati pallide flavi. *Sepala* 2, anguste linearia, acuminata, 6–7 mm. longa. *Vexillum* parvum, orbiculare, muticum, costa dorso vix carinata. *Alae* ad 1·5 cm. longae, longe stipitatae, stipite geniculatim incurvo; lobus basalis 0 vel ad basin stipitis minimus, distalis late dolabriformis, obtusus; auricula dorsalis stipiti alarum inserta. *Labelli* limbus cymbiformis, acutus; calcar limbo subaequilongum vel longius incurvum. *Filamenta* brevia, subulata. *Ovarium* sessile, rectum, anguste ovoideum, acutum.

Travancore. Devicolam: straggling amongst grass on a hill top, 2134 m., *A Meebold*, 13,480.

Meebold describes this species as "almost tomentose," with pink flowers, and records that it was only seen in this locality.

4. I. **macrocarpa**, *Hk. f.*; sp. nov.; *I. cuspidatae*, Wight & Arn., affinis, sed nullibi glauca nisi foliis subtus glaucis, sepalis longe cuspidatim acuminatis, capsulis 1·5–2 cm. longis seminibusque 5 mm. longis.

Frutex? glaberrima, parviflora, ramis elongatis longe nudis patulis. *Folia* 8–10 cm. longa, longe petiolata, infima opposita?, superiora 3–5-natim verticillata, firma, obovato-lanceolata, longe acuminata, serrulata, basi setosa et in petiolum nunc sparse setaceum 3–5 cm. longum sensim angustata, nervis utrinque 6–7; glandulae infrapetiolares 0? *Inflorescentia* simpliciter pedicellata; pedicelli solitarii vel bini, florentes petiolis subaequilongi, fructiferi 5–8 cm. longi, validi, apice decurvi. *Flores* ad 1·5 cm. expansi, albi? *Sepala* 2, parva, 4–6 mm. longa, ovata, longe cuspidatim acuminata, coriacea. *Vexillum* obcordato-reniforme, 1·5–2 cm. latum, costa tenui cuspidata. *Alae* breves, sessiles; lobus basalis amplus, oblongus vel obovatus, patens vel recurvus; distalis parvus, erectus, oblongus, obtusus; auricula dorsalis 0. *Labelli* limbus profunde cymbiformis, ad 6 mm. longus, longe cuspidatus; calcar limbo bis terve longius, robustum, incurvum. *Filamenta* brevia, subulata. *Ovarium* ovoideum, obtusum. *Capsulae* 1·5–2·2 cm. longae, oblique ovoideae, sessiles, obtuse rostratae, pendulae, polyspermae. *Semina* obovoidea, 5 mm. longa, minute granulata, castanea.

Travancore. Devicolam, 1829 m., *A. Meebold*, 13,462.

Described by Mr. Meebold as 4 metres high with rather weak long branches.

5. I. **cochinica**, *Hk. f.*; sp. nov.; *I. floribundae*, Wight, affinis, differt foliis non caudatim acuminatis, sepalis minutis ovatis, alis brevibus lobis subaequalibus.

Frutex? 4–5 dm. alta, glabra vel parce puberula, ramosa, parviflora, caule ramisque divaricatis rigidis. *Folia* alterna et apices versus ramulorum fasciculata, 6–10 cm. longa, petiolata, firma, ovata vel ovato-lanceolata, acuta vel acuminata, crenata, setulis interjectis 0 vel minimis, basi in petiolum 2–4 cm. longum gracilem angustata, nervis utrinque 6–10; glandulae infrapetiolares 0. *Inflorescentia* simpliciter pedicellata; pedicelli foliis breviores, in axillis inferioribus solitarii, in supremis quasi fasciculati, fructiferi

patuli vel deflexi, 3–5 cm. longi. *Flores* expansi ad 1 cm. longi, labello pubescente. *Sepala* 2, deltoideo-ovata, ad 1 mm. longa. *Vexillum* orbiculare, 2-lobum, sinu uncinatum. *Alae* breves, ad 8 mm. longae et latae, sessiles ; lobi consimiles, late obcordati, basalis distali paullo minor ; auricula dorsalis rotundata. *Labelli* limbus cymbiformis, 6 mm. longus, horizontalis acuminatus ; calcar limbo triplo longius, gracile incurvum. *Filamenta* brevia, subulata. *Ovarium* fere rectum. *Capsulae* ad 1·5 cm. longae, breviter stipitatae, turgidae, gibbosim ovoideae, acuminatae vel rostratae, oligospermae. *Semina* late obovoidea, 2 mm. longa, pubescentia.

COCHIN. Kalvalay : near a stream, under trees, 610 m. *A. Meebold*, 12,183.

6. I. verecunda, *Hk. f.* ; sp. nov. ; *I. eleganti*, Bedd., proxima, differt foliis minoribus basi rotundatis, pedunculo breviore gracili lobo basali alarum parvo distalique amplo et calcare labelli limbo dimidio breviore.

Herba parva, 1–1·5 dm. alta, glaberrima, flaccida, parviflora, caule simplici vel ramoso, ramis patulis. *Folia* 4–6 cm. longa, alterna, petiolata, membranacea, ovata vel ovato-rotundata, acuminata vel acuta, crenata, setulis interjectis 0, basi rotundatis, nervis utrinque 3–4, petiolo gracili, 2–3 cm. longo ; glandulae infrapetiolares 0. *Inflorescentia* pedunculata, pedunculo gracili foliis breviore apice subumbellatim 2–4- flore ; pedicelli 1–2 cm. longi, fructiferi patuli vel deflexi ; bracteae lanceolatae, 3–5 mm. longae, persistentes. *Flores* ad 2 cm. expansi, rosei, macula purpurpea ima basi alarum instructa. *Sepala* 2, late-ovata, acuminata, cuspidifera, 6–7 mm. longa, 5-nervia, basi truncata. *Vexillum* orbiculare vel late oblongum, 6–9 mm. diametro, muticum vel apiculatum, costa dorso carinata. *Alae* sessiles, 1·3–1·5 cm. longae ; lobus basalis minutus, orbicularis, ima basi distali plus minusve incumbens ; distalis amplus, trigono-dolabriformis, obtusus, auricula dorsalis obscura. *Labelli* parvi limbus orbicularis, apiculatus, 6–7 mm. diametro, horizontalis ; calcar limbo dimidio brevius, obtusum. *Capsulae* anguste ellipsoideae, fere rectae, acute rostratae, vix stipitatae, polyspermae. *Semina* obovoidea vel globosa, compressa, 2–2·5 mm. longa, dense pubescentia.

TRAVANCORE. Periakanal : on a steep mossy embankment under trees, 1372 m. *A. Meebold*, 13,125 ; Devicolam, 1829 m. *A. Meebold*. 13,934.

XLIX.—DIAGNOSES AFRICANAE : XLV.

1291. **Crassula globosa**, *N. E. Brown* [Crassulaceae] ; affinis *C. deltoideae*, Linn. f., sed foliis paucioribus subsphaeroideis supra applanatis dorso ecarinatis differt.

Herba carnosa, 5–6 cm. alta, caespitoso-ramosa ? *Rami* foliiferi 1–1·5 cm. longi. *Folia* circa 6, conferta, sessilia, subglobosa, supra applanata, obtusissima, ecarinata, 1–1·2 cm. longa, 1·1–1·3 cm. lata, 0·9–1·1 cm. crassa, levia, glabra, subtessellato-glauca. *Pedunculus* terminalis, gracilis, 3–4·5 cm. longus, infra nudus, superne 3-ramosus, glaber. *Bracteae* 1–2·5 cm. longae, 0·75–1 mm. latae, lanceolatae, acutae, puberulae. *Flores* perparvi, 2·5 mm. longi, ellipsoidei,

ore contracti et vix 2 mm. diametro, sessiles, in capitula parva congesti. *Calyx* 1·75 mm. longus, puberulus; lobi 1·5 mm. longi, lanceolati, acuti. *Petala* 2 mm. longa, oblonga, acuta, plana, erecta, apice recurva, glabra, alba. *Glandulae hypogynae* late cuneato-obcordatae, aurantiacae. *Carpella* compresso-oblonga, papillato-puberula; stigma sessile, luteum.

South Africa. South-western part of Cape Colony, *Pearson*, 5474.

Described from a living plant which flowered at Kew in August, 1911, collected by Prof. Pearson and Mr. N. S. Pillans during the Percy Sladen Expedition to the Orange River in 1910. The subglobose leaves, resembling small marbles flattened on one side, arranged in about three pairs on each growth, give this plant a very distinct appearance from all others known to me, but it is undoubtedly allied to *C. deltoidea*, Linn. f.

1292. **Crassula humilis**, *N. E. Brown* [Crassulaceae]; affinis *C. deltoideae*, Linn. f., sed foliis, deltoideo-ovatis patentibus nec imbricatis viridibus vix glaucis et petalis erectis differt.

Herba succulenta, 6–8 cm. alta, caespitoso-ramosa. *Rami* foliiferi 1·3–2 cm. longi, foliis 10–14 instructi. *Folia* conferta, sessilia, nec connata, 0·7–1·5 cm. longa, 0·6–1 cm. lata, 4–8 mm. crassa, deltoideo-ovata, supra subplana vel convexiuscula, dorso obtuse carinata, levia, glabra, viridia vel subcinereo-viridia, vix glauca, epunctata. *Pedunculus* terminalis, gracilis, 3·5–5 cm. longus, glaber, inferne vel prope medium bractearum paribus 1–2 instructus, apice breviter cymoso-ramosus. *Flores* perparvi, sessiles, capitato-congesti. *Calyx* 2–2·3 mm. longus, minutissime puberulus; lobi 1 mm. longi, deltoideo-ovati, obtusi. *Petala* e calyce breviter exserta, 2–2·3 mm. longa, basi connata, oblonga, subobtusa, plana, erecta, apice leviter recurva, alba. *Glandulae hypogynae* late cuneatae, apice emarginatae, albidae. *Carpella* oblonga, obtusa, glabra; stigma sessile, nigrum.

South Africa. South-western part of Cape Colony, *Pearson*, 5484.

Described from a living plant which flowered at Kew in August, 1911, collected by Prof. Pearson and Mr. N. S. Pillans during the Percy Sladen Expedition to the Orange River in 1910.

1293. **Mesembryanthemum dealbatum**, *N. E. Brown* [Ficoideae-Mesembryeae]; affine *M. obtuso*, Haw., sed foliis aequalibus crassioribus et albidis, floribus breviter pedunculatis et calyce 5-lobo bene distinguitur.

Herba acaulis, caespitoso-ramosa, ramis brevissimis 4-foliatis. *Folia* adscendentia, opposita, basi subconnata, 3–4 cm. longa, 1·5 cm. lata et crassa, obtuse trigona, obtusissima, levia, albida (nec glauca), impunctata. *Flores* terminales, solitarii, breviter pedunculati, folia vix excedentes. *Pedunculus* cum ovario obconico 1·6–2 cm. longus, basi bracteis duabus parvis compressis instructus, albidus. *Calyx* 5-lobus, albidus, lobis 1·2–1·3 cm. longis ovatis vel ovato-lanceolatis apice plus minusve gibbosis. *Petala* 2–3-seriata, 1·3–1·5 cm. longa, linearia, obtusa, pallide rosea. *Stamina* in conum erectum collecta, filamentis albis, antheris luteis. *Styli* 10, erecti, staminibus longiores, flavo-virentes.

South Africa. Little Namaqualand, *Pearson*, 6062.

Described from a living plant which flowered at Kew in June, 1911, collected by Prof. Pearson during the Percy Sladen Expedition to the Orange River in 1910.

This species would also appear to be allied to *M. cinereum*, Marloth, but the leaves of that species are described as being papillate and the flowers white and remaining open night and day, which is not the case in *M. dealbatum*, whose flowers open only in the afternoon and close during the night; they are of a pleasing pale pink colour, with a dense cone of white stamens, from which the tips of the 10 styles are exserted.

1294. **Chrysophyllum viridifolium**, *Wood et Franks* in Natal Plants, vol. vi, t. 569 [Sapotaceae]; similis *C. Welwitschii*, Hiern, sed petiolis et pedicellis duplo longioribus facile distinguitur.

Arbor 10–15 m. alta, trunco basi 1·5 m. diametro. *Folia* alterna; petiolus 0·8–1·2 cm. longus, primum cum perulis rufescenti-puberulus; lamina 2·5–10 cm. longa, 2–4·3 cm. lata, oblonga, obtuse acuminata, basi rotundata, utrinque glabra, viridis, venis numerosissimis patentissimis parallelis. *Flores* axillares, fasciculati, perparvi. *Pedicelli* 3–4 mm. longi, adpresse rufescenti-puberuli. *Sepala* 1·5–2 mm. longa, ovata vel elliptico-oblonga, obtusa, adpresse rufescenti-puberula. *Corolla* subcampanulata, ad medium 5-loba, 2 mm. longa, glabra, lobis oblongis obtusis ciliatis. *Stamina* 5, tubo corollae inserta, quam corollae lobi breviora, glabra. *Ovarium* subglobosum, dense rufescenti-pubescens, in stylum crassum brevem attenuatum. *Fructus* subglobosus, 3–3·3 cm. diametro, glaber, levis, luteus. *Semina* semilunata, 1·3–1·5 mm. longa, 0·9–1 cm. lata, compressa, acute carinata, brunnea, nitida, hilo lineari.

South Africa. Natal: Berea, near Durban, 30–90 m., *Miss Franks in Herb. Wood*, 11,636.

1295. **Stapelia similis**, *N. E. Brown* [Asclepiadaceae-Stapelieae]; persimilis *S. olivaceae*, N.E. Brown, sed floribus minoribus intra glabris eciliatis, coronae interioris lobis toto incumbentibus nec bicornutis differt.

Caules erecti, 7–15 cm. longi, 0·6–1 cm. crassi, 4–6-angulati, minute puberuli, sordide purpurei vel cinereo-virides, purpureo-maculati; anguli subdenticulati. *Flores* 3–6 ad basin caulium enati. *Pedicelli* 2·5–3 cm. longi, patentes, puberuli. *Sepala* 4 mm. longa, lanceolata, acuta, puberula. *Corolla* rotata, 1·8 cm. diametro, extra minute puberula, intra transverse rugosa, glabra, eciliata, atro-purpurea; lobi 6 mm. longi et lati, ovati, acuti. *Coronae* exteriores lobi 0·75 mm. longi, 1·5 mm. lati, transverse oblongi, integri, glabri, atrati; lobi interiores 1·3 mm. longi, lanceolati, acuti, dorso leviter gibbosi, antheris incumbentes.

South Africa. Little Namaqualand, *Pearson*, 6134.

Described from a living plant which flowered at Kew in August, 1911, collected by Prof. Pearson during the Percy Sladen Expedition to the Orange River. When out of flower this plant might easily be mistaken for *S. olivacea*, N.E. Brown.

1296. **Penaea Candolleana**, *E. L. Stephens* [Penaeaceae]; a *P. ericoide*, Endl., foliis ellipticis differt.

Fruticulus circiter 3 dm. altus, ramosus; rami in partibus inferis defoliati, cortice subrufo obtecti. *Folia* in partibus superis

conferta, erecta vel patula, basi in petiolos breves attenuata, elliptica, obtusa vel acuta, plerumque subter in medio parum sulcata, 6–8 mm. longa, 2–2·5 mm. lata, exstipulata; setulae paucae, minutae utrinque in foliorum bractearum bracteolarumque axillis. *Flores* laterales; bracteae foliis similes, persistentes; bracteolae 2, in pedicelli apice sitae, ante anthesin deciduae, ellipticae vel lanceolatae, medio coriaceae, margine membranaceae, bracteis breviores. *Perianthium* anguste cylindrico-ovatum, 7–8 mm. longum; tubus limbo bis longior; lobi deltoidei, acuminati; stylus lobis 4 planis oblongis cruciformibus superatus, sub quoque lobo angulatus.

South Africa. Without locality, old collector in Herb. De Candolle. Coast Region: Stellenbosch, "procumbent on the rocks," *Niven in Herb. Mus. Brit.*

1297. **Loranthus** (**Constrictiflori**) **crispatulus**, *Sprague* [Loranthaceae-Eulorantheae]; affinis *L. tschintschochensi*, Engl., et *L. Buvumae*, Rendle, ab illo calyce ascendente, ab hoc foliis basi rotundatis, ab ambobus nervis lateralibus foliorum utrinque 2 recedit.

Rami adulti griseo-brunnei, subtiliter lenticellati, glabri, 4–6 mm. diametro; ramuli crassiusculi, subtiliter striati, minute dense puberuli, circiter 4 mm. diametro 23 cm. infra apicem; internodia 2·5–6·3 cm. longa. *Folia* opposita, ovata vel ovato-lanceolata, acute acuminata, basi rotundata vel seniora subcordata, rarius obtusa, 6·5–11·5 cm. longa, 3·2–7 cm. lata, coriacea, interdum tenuiter, glabra, margine crispatula; nervi laterales utrinque 2, obliquissimi, superiores costae subparalleli, supra leviter elevati, subtus prominentes, venulis vix visis; petioli 4–7 mm. longi, minute puberuli vel glabri. *Umbellae* axillares, solitariae, vel in ramis senioribus fasciculatae; pedunculus 3·7–4 mm. longus, crassus, basi incrassatus, minute dense puberulus, praesertim apice, cavis pedicellorum patelliformibus 1·3–1·5 mm. diametro apicem parvum planum vel concavum pedunculi circumdantibus; pedicelli 2 mm. longi, ut bractea minute dense puberuli; bractea breviter ovato-cupularis, obtusa, margine dorsali 1–1·3 mm. longo, margine ventrali 0·5 mm. longo. *Torus* calycecum campanulatus ore lato, 3·7 mm. longus, minute puberulus, dimidio inferiore quam superiore multo angustiore; torus 1·8 mm. longus, 1·3 mm. diametro. *Calyx* suberecto-ascendens, 1·8 mm. longus, subtruncatus margine breviter irregulariter fisso. *Corolla* in alabastro circiter 4·5 cm. longa, depresso-truncata, extra minute pilosa; tubus circiter 2 cm. deorsum unilateraliter fissus, ampulla basali oblongo-ellipsoidea, 4·5–5 mm. longa; lobi reflexi, spathulati, 8 mm. longi, superne 1·8 mm. lati, apice sub angulo recto inflexi, angulo exteriore in labrum ascendens dorsale producti. *Filamenta* circiter 0·25 mm. infra basin corollae loborum inserta, involuta, sursum sensim angustata, 5 mm. longa, dente ventrali 0·5–0·7 mm. longo; antherae anguste oblongae, 2·3 mm. longae. *Discus* 0·5 mm. altus, vix lobatus. *Stylus* superne metuliformis, parte incrassata circiter 7 mm. longa, collo 1·8 mm. longo; stigma ellipsoideum, 0·9 mm. longum, subtruncatum.

Tropical Africa. Congo State: Nouvelle Anvers, parasitic on *Coffea liberica*, Hiern, *De Giorgi*, 5, 6.

Described from specimens in the Brussels Herbarium.

1298. **Loranthus (Constrictiflori) findens,** *Sprague* [Loranthaceae-Eulorantheae]; affinis *L. constrictifloro*, Engl., a quo foliorum marginibus crispatis nervisque lateralibus minus obliquis, corollae lobis profunde sejungentibus differt.

Ramuli rubello-brunnei, subtiliter dense lenticellati, glabri. *Folia* ovato-lanceolata, breviter obtuse acuminata, basi rotundata, 6–8 cm. longa, 2·5–3·7 cm. lata, coriacea, glabra, utrinque opaca, margine crispata; nervi indistinctissimi, laterales satis obliqui, venis vix visis; petioli circiter 6 mm. longi. *Umbellae* axillares, solitariae, 4-florae, glabrae; pedunculus crassus, 2–2·5 mm. diametro, area apicali plana parva cavis pedicellorum patelliformibus 1·5 mm. diametro circumdata; pedicelli crassi, 1·3 mm. longi; bractea breviter oblique cupularis, margine dorsali 1·3 mm. longo, margine ventrali 0·8 mm. longo. *Torus* calycecum anguste campanulatus, 3 mm. longus; torus 1·5 mm. longus, sursum sensim ampliatus, apice 1·5 mm. diametro. *Calyx* ascendens, 1·5 mm. longus, truncatus, irregulariter fissus, intus juxta basin annulo paullo incrassato. *Corolla* in alabastro 4–5 cm. longa, glabra; tubus omnes inter lobos usque ad 0·8–1·6 cm. infra insertionem staminum findens, ampulla basali obovoidea 4·5 mm. longa; lobi reflexi, lanceolato-spathulati, parte superiore dilatata lanceolata acuta 4 mm. longa, 1·3 mm. lata. *Filamenta* circiter 9 mm. infra apices loborum inserta, inflexa, sursum sensim angustata, 5–5·5 mm. longa, dente ventrali 0·5 mm. longo; antherae oblongae, 1·8 mm. longae. *Discus* pentagonus, vix lobatus, 0·3 mm. altus. *Stylus* superne metuliformis, parte incrassata 5 mm. longa, collo 2 mm. longo, dimidio superiore multo crassiore quam dimidio inferiore; stigma oblongo-ellipsoideum, 1·2 mm. longum.

Tropical Africa. Congo State: Lukolela, Dec., 1900 (collector not known).

Described from a specimen in the Brussels Herbarium.

1299. **Jatropha Brockmanii,** *Hutchinson* [Euphorbiaceae-Jatropheae]; affinis *J. lobatae*, Muell.-Arg., sed foliis confertis fere ad basin tripartitis, segmentis oblongo-lanceolatis, stipulis multo longioribus confertis differt.

Rami crassi, carnosi, cortice pallide flavo obtecti. *Folia* conferta, fere ad basin tripartita, basi subcuneata, circiter 4 cm. longa et lata, rigide membranacea, utrinque glabra, segmentis oblongo-lanceolatis grosse dentatis dentibus acutis glanduloso-apiculatis, nervis lateralibus utrinque 8 distinctis; petioli vix 1·5 cm. longi, glabri; stipulae confertae, in segmenta 1·3–2 cm. longa filiformia glabra glanduloso-apiculata dissectae. *Cymae* pedunculatae, pauciflorae; pedunculi 4 cm. longi, glabri; bracteae ovato-lanceolatae, pectinatim glanduloso-dissectae, 4 mm. longae. *Flores* ♂: *Sepala* oblongo-obovata, acuta, 2·5 mm. longa, superne glanduloso-dentata, glabra. *Petala* obovata, basi libera, integra, glabra, quam sepala paullo longiora. *Disci glandulae* rotundatae, laeves, carnosae. *Stamina* 8; filamenta inferne connata. *Flores* ♀ pedicellati. *Sepala* ut in floribus ♂, majora. *Petala* non visa. *Discus* patelliformis, undulate lobatus. *Ovarium* ignotum.

Tropical Africa. Somaliland: Golis Range, *Drake-Brockman*, 131.

The specimen is somewhat incomplete, but I have no doubt as to its being undescribed after comparison with all Pax's new species kindly lent to Kew by Prof. Engler.

1300. **Jatropha confusa**, *Hutchinson* [Euphorbiaceae-Jatropheae]; affinis *J. pseudoglanduliferae*, Pax, foliis ad medium lobatis, sepalis ♂ pectinatim dentatis valde distincta.

Frutex ad 2 m. altus, ramosus, carnosus; rami crassi, teretes, glabri. *Folia* ambitu suborbicularia, basi cordata, 6–10 cm. longa, 9–14 cm. lata, circiter ad medium digitatim 5-lobata, rigide subchartacea, acute glanduloso-serrulata, glabra nervis supra parce puberulis exceptis; lobi oblongo-ovati, acuti, 3–4·5 cm. lati, nervis lateralibus utrinque 6–8 distinctis patulis prope marginem ramosis, venis subtus distinctis; petioli 3–10 cm. longi, glabri, eglandulosi; stipulae in segmenta linearia 10 dissectae, circiter 4 mm. longae, glanduloso-apiculatae, glabrae. *Cymae* longe pedunculatae, subthyrsoideae, circiter 4 cm. latae; pedunculi robusti, 10 cm. longi, glabri; bracteae anguste lanceolatae, acutae, ad 1 cm. longae, glanduloso-pectinatae, glabrae. *Flores* ♂: *Sepala* ovata, subacuta, 5 mm. longa, 2·5 mm. lata, glabra, pectinatim dentata. *Petala* obovata, apice rotundata, vix 1 cm. longa, 5 mm. lata, integra, glabra. *Disci glandulae* magnae, ovatae, carnosae, 2 mm. longae. *Stamina* 8; filamenta inferne connata; antherae magnae, oblongae, 3·5 mm. longae. *Flores* ♀: *Sepala* quam ♂ multo majora. *Petala* obovato-elliptica, integra, 1·3 cm. longa, 7 mm. lata, multistriata. *Discus* cupularis, undulate lobatus, glaber. *Ovarium* glabrum; styli breves, bilobi, stigmatibus crassioribus. *J. lobata*, var. *senegalensis*, Muell.-Arg. in DC. Prodr., vol. xv., part ii., p. 1086, partim. *J. lobata*, subsp. *senegalensis*, Pax in Engler, Pflanzenreich, Euphorb.—Jatroph., p. 33, partim. *J. glauca*, var. *senegalensis*, Hiern in Cat. Afr. Pl. Welw. i. 969.

Tropical Africa. Angola: Mossamedes; by fences around cotton plantations, half wild, and in thickets at the edges of mandioc fields near the mouth of the River Bero, *Welwitsch*, 299.

This plant was regarded as a variety (*senegalensis*) of *J. lobata*, Muell.-Arg. (*Croton lobatus*, Forsk.), by Mueller in De Candolle's Prodromus, and later by Hiern and by Pax, though it appears to me quite distinct and easily separated from that species. Mueller associated with it specimens collected by *Lelièvre* and by *Perrottet* (No. 733) in Senegambia, and these are identical with *J. Chevalieri*, Beille, described from specimens collected by Chevalier in the same region. Beille, however, did not recognise the identity of his plant with Mueller's var. *senegalensis*.

J. lobata, Muell.-Arg. (typical), is confined to the extreme eastern Sudan and Abyssinia, extending into Arabia; whilst *J. Chevalieri*, Beille, inhabits Senegambia, and the species here described has so far been found only in Angola.

L.—OSTRYOCARPUS AND A NEW ALLIED GENUS OSTRYODERRIS.

S. T. Dunn.

One of the earliest botanical collections made in Tropical West Africa was that conducted by Theodor Vogel during the expedition organised by the African Civilisation Society in 1841, and usually known as the Niger Expedition. Sierra Leone, the Niger River and the Island of Fernando Po were in turn visited and explored and in each of these places specimens were gathered of the remarkable leguminous shrub on which the genus *Ostryocarpus* was founded. The botanical collections and information amassed by Vogel were entrusted on the return of the expedition to the Director of Kew, Sir William Hooker, for description and publication and among the other botanists who eventually took part in the work was his son, now Sir Joseph Hooker. The leguminous plant referred to above thus came into the hands of that great botanist at the beginning of his long and distinguished career and was at once recognised by him as the type of a new genus allied to *Lonchocarpus* from which it was distinguished by its diadelphous stamens and peculiar shell-like pod. It is from the latter characteristic that the name is presumably derived (ὄστρεον a shell).

Two other West African shrubs possess, like it, glabrous exstipellate leaflets, short-stalked flowers crowded on short special branchlets, nearly sessile broad glabrous standards, hooked wings and keel petals and a short 2–3-ovuled gynoecium surrounded at the base by a fimbriate disk which is usually adnate to the consolidated base of the calyx.

Ostryocarpus, *Hook. f.* Niger Fl. (1849) 316 ; Benth. et Hook. f. Gen. Plant. i. 548 ; Baker in Fl. Trop. Afr. ii. 240 ; Engl. et Prantl, Pflanzenfam. 3, iii. 343.

Tropical West Africa : French Congo to Senegambia.

Leaflets 5, panicle branchlets short, floriferous to base ... ... *O. riparius*

Leaflets 9—

Leaflets acute, reticulate above, flowering branchlets bare at base ... ... *O. Zenkerianus.*

Leaflets obtusely acuminate, smooth, flowering branchlets floriferous to base ... ... *O. lucidus.*

O. riparius, *Hook. f.* Niger Fl. (1849) 316.

A climbing or straggling shrub with yellowish-white flowers, widely distributed in the coastal regions of West Tropical Africa.

Tropical Africa. Senegambia : River Nunez, *Heudelot*, 817. Sierra Leone : Bagru River, *Mann*, 832, and without precise locality, *Vogel*, 59, 146. Liberia : Sinoe Basin, *Whyte*, and without precise locality, *Dinklage*, 1725. Ivory Coast, *Preuss*, 1166, *Chevalier*, 17,876. Cameroons, *Winkler*, 479. Fernando Po : Gutridge Bay, *Vogel*, 107. Spanish Gaboon : River Muni, *Mann*, 1768. Gaboon : Como River, *Bates*, 484.

O. Zenkerianus, *Dunn*, nom. nov.; *Millettia Zenkeriana*, Harms in Engl. Jahrb. xxvi. 291.

Tropical Africa. Cameroons : Sanaga, *Zenker*, 1453.

O. lucidus, *Dunn*, nom. nov.; *Derris lucida*, Welw. ex Baker in Fl. Trop. Afr. ii. 245; *Millettia breviflora*, De Wild. in Ann. Mus. Congo, sér. 5, i. 136.

This species appears to prefer wooded situations and to climb over high trees; it flowers in June.

Tropical Africa. Lower Congo: Valley of the River Djama, *Gillet*, 2845. Angola: Golungo Alto, *Welwitsch*, 1877, 1878.

In the thyrsoid nature of its inflorescence *Ostryocarpus* approaches the section of *Millettia* to which *M. macrostachya*, Dunn (*Lonchocarpus macrostachyus*, Hook. f.), belongs and which likewise possesses glabrous petals, but in other characters it is easily distinguishable, even without fruit, from that well defined group.

It will be observed from the synonomy that neither of the species here associated with Hooker's was originally referred to the genus of which he made it the type. Mention must now be made of the three species which had previously been ascribed by their authors to *Ostryocarpus*, but which differ in so many points from the three above enumerated that it is preferred to defer the consideration of their inclusion until fuller material is obtained. These are *O.? Welwitschii*, Baker in Fl. Trop. Afr. ii. 240, and *O. parvifolius*, M. Mich. in De Wild. et Th. Dur. in Ann. Mus. Congo, sér. 3, i. 71, in which the inflorescence is not thyrsoid, and *O. major*, Stapf, in Journ. Linn. Soc. xxxvii. 96, in which the leaflets are stipellate and the ovary 5–6-ovulate.

Another group comprising three species of West African shrubs with thyrsoid panicles of white flowers must be placed near *Ostryocarpus*. It is characterised by stipellate leaflets, conspicuously bracteate flowers, glabrous petals, winged pod and by the spreading, not adpressed radicle of the embryo, which distinguish it from all allied genera, though in its inflorescence it is closely associated with *Ostryocarpus* and in its pod with *Derris*. It is therefore proposed to describe it as a new genus under the name of *Ostryoderris* to indicate its connection with those two genera.

Ostryoderris, *Dunn*, gen. nov. *Derri*, Lour., affinis, sed foliolis stipellatis distincta.

Frutices scandentes vel diffusi. *Folia* alterna, imparipinnata; foliola stipellata. *Paniculae* terminales, thyrsoideae. *Flores* saepissime conspicue bracteati. *Calyx* campanulatus, 5-dentatus. *Petala* glabra; vexillum breviter unguiculatum, vix callosum; alae antice haud hamatae. *Stamina* diadelphia, vexillare solutum. *Discus* calyci adnatus. *Ovarium* pauci-ovulatum. *Legumen* indehiscens, compressum, ala utrinque marginatum, valvis inter semina cohoerentibus. *Semina* lenticularia; embryonis radicula brevis, patens, nec cotyledonibus adpressa.

Tropical West Africa.

Leaflets ferrugineous beneath ... ... *O. impressa.*
Leaflets glabrous beneath—
Flower bracts erect, persistent until flowering time ... ... *O. leucobotrya.*
Flower bracts folded over the top of the buds, early deciduous ... ... *O. gabonica.*

O. impressa, *Dunn*. *Frutex* scandens, ramulis striatis tenuiter rufis. *Folia* 4–5-juga, 20–30 cm. longa; stipulae lanceolatae,

acutae, 2·5 cm. longae, tarde deciduae ; foliola superiora lateralia longe acuminata, basi rotundata, 7–10 cm. longa, chartacea, subtus ut rachis tenuiter rufa ; venae margini propinquantes 8–11-jugae, supra impressae, subtus prominentes ; petioluli 2–3 mm. longi ; stipellae setaceae, 4–5 mm. longae. *Panicula* angusta, terminalis, ad 25 cm. longa, rachi ut ramulis calycibusque laxe rufo-sericea ; ramuli floriferi 3–4 cm. longi. *Flores* dense conferti, 1·5 cm. longi ; pedicelli 1 mm. longi ; bracteae 1·6 cm. longae, lanceolatae, acutae, tenuiter rufae. *Calyx* 5 mm. longus, dentibus latis brevibus. *Petala* glabra, albida, nigricantia ; vexillum rotundatum, basi in unguem brevissimum angustatum, 1·3 cm. longum ; alae oblongae, ad basin gradatim angustatae ; carina in unguem subito contracta nec hamata. *Stamina* diadelphia. *Ovarium* velutinum, 6–7 ovulatum. *Legumen* ignotum.

Tropical Africa. Southern Nigeria : Calabar District, *Williams*, 4.

O. leucobotrya, *Dunn*. *Frutex* vel *arbor* parva, praeter inflorescentiam glabra ; cortex laevis, lenticellatus. *Folia* 4- (3- vel 5-) juga, nigricantia, 15–25 cm. longa, petiolo 5-plo longiora ; stipulae oblongo-lineares, 2·5 cm. longae, tarde deciduae ; foliola superiora lateralia ovato- vel lineari-oblonga, acuminata, caudata, apice truncata vel retusa, basi rotundata, 6–9 cm. longa, chartacea ; nervi circiter 6-jugi, infra paullo prominentes ; petioluli 2–3 mm. longi ; stipellae setaceae, 3 mm. longae. *Paniculae* angustae, terminales, 25–40 cm. longae, rachi ut ramulis calycibusque dense velutina ; ramuli floriferi 4–6 cm. longi, bracteis magnis deciduis suffulti. *Flores* dense conferti, 1·2–1·3 cm. longi ; pedicelli graciles, 2–2·5 mm. longi ; bracteae 0·9–1 cm. longae, albae, sericeae, deciduae ; bracteolae 2, minutae. *Calyx* campanulatus 3–3·5 mm. longus, dentibus brevibus latis. *Petala* glabra, albida, nigricantia ; vexillum ovatum, cuneatum, ad laminae basin paullo incrassatum ; alae carinaque basi cuneatae. *Stamina* diadelphia. *Ovarium* velutinum, 6–7-ovulatum. *Legumen* complanatum, oblongum, apice basique obtuse acutum, ala coriacea 4–5 mm. lata cinctum, 2-spermum, glabrum, flavidum.

The flowers, which are preceded by a dense panicle, white with bract-covered buds, appear in December.

Tropical Africa. Sierra Leone : in forest on the way to Lester Peak, *Scott Elliot*, 3842 ; Pangumu, *Smythe*, 62 ; rain forest, *Sierra Leone Herb.* 35. Ivory Coast : Bingerville, *Chevalier*, 17,304.

O. gabonica, *Dunn*, nom. nov. ; *Andira ? gabonica*, H. Baillon in Adansonia, vi. 219 (adnot.) ; *Lonchocarpus? macrostachyus*, Hook. f. in Hook. Niger Fl. 317. *Descr. addend.*

Legumen oblongum, apice obtusum, basi cordatum, complanatum, ala coriacea 7–9 mm. lata utrinque marginatum, 12–17 cm. longum, 3·5–4·5 cm. latum, 2–3-spermum. *Semina* lenticularia, rhomboidea, radicula patente in basin saccatam testae intrusa.

Tropical Africa. Southern Nigeria : Old Calabar River, *Mann*, 2244. Cameroons : Cameroon River, *Mann*, 2192. Gaboon : (type of *Andira? gabonica*, Baill.), *Duparquet*, 32, *Klain* 321, 706, 2096.

A straggling shrub with whitish bracts covering the buds, which develop from December to February into white or pinkish flowers.

LI.—ADDITIONS TO THE WILD FAUNA AND FLORA OF THE ROYAL BOTANIC GARDENS: XII.

The last list of additions to our Wild Fauna and Flora was published in 1910 (*K.B.* 1910, pp. 79–84). Since that date a considerable number of new observations have been recorded which cover a wide range of natural objects.

Specimens belonging to certain special groups have been kindly examined by various authorities whose names are recorded under their particular subjects, but our thanks are also due to the authorities of the British Museum, to Dr. A. Günther, Prof. J. W. H. Trail, Mr. R. S. Bagnall, and to the Rev. F. D. Morice and others for much kind help in the identification of specimens. To the members of the garden staff our thanks are also due, as the collection of the specimens herein recorded is largely due to their enthusiastic co-operation.

AVES.

Passeres.

Cotyle riparia, *L.* "Sand Martin." Seen flying over the pond with House Martins, October 7, 1911. Sand martins often occur in spring and autumn in localities where they are not found in the summer; such individuals are probably migrants to or from more northern districts.

REPTILIA.

Lacertilia.

Lacerta agilis, *L.* "Lizard." In rock garden. Coll. J. Sharps. A species not uncommon in the New Forest, but very scarce and probably introduced in these parts of the country.

MOLLUSCA.

Hyalinia lucida, *Drap.* In fern houses. Coll. E. W. Morse. Occurs in various places throughout the British Isles.

ARTHROPODA.

Malacostraca.

Porcellio laevis, *Brandt.* Propagating pits. Coll. J. W. Judd.

Armadillidium depressum, *Brandt.* Propagating pits. Coll. J. Lambourne.

ANTENNATA.

Myriapoda.

Chilopoda (Centipedes).

Rhysida longipes, *Newp.* In Wardian case from Peru. Coll. H. Downer. A species widely distributed in tropical countries.

Diplopoda (Millipedes).

Glomeris marginata, *Vitt.* In fern houses. Coll. T. G. Bullock,

INSECTA.

Thysanura (Bristle-tails).

Campodea staphylinus, *Woodw.* Orchid houses. Coll. J. James,

Lepisma saccharina, *Linn.* "Silver-fish." Tropical fern house. Coll. H. Green. One of the most primitive of insects.

Thermitobia domestica, *Pack.* Coll. H. Green. Previously recorded from the Royal Botanic Gardens, Edinburgh.

Collembola (Spring-tails).

Orchesella villosa, *Geof.* Fern houses. Coll. J. D. Snowden.

Tomocerus plumbeus, *Linn.* Orchid houses. Coll. J. James.

Diptera.

Bibio marci, *L.* ♀. Propagating pits. Coll. H. Downer.

Chironomus? plumosus, *L.* ♂. Propagating pits. Coll. A. Aubrey.

Culex pipiens, *L.* ♀. Herbaceous grounds. Coll. W. Irving. One of the blood-sucking species of gnats or mosquitos, widely distributed in and beyond Europe.

Theobaldia annulata, *Schrank.* ♀. Said to suck fluid of plants, but sometimes also sucks blood, inflicting a severe bite.

Syrphus ribesii, *L.* In office.

Eristalis tenax, *L.* Coll. J. Mingay. Larva of the Drone fly, found in wood. The larvae are known as Rat-tailed maggots.

Myiatropa florea, *L.* In fern houses. Coll. T. G. Bullock. Fairly common, larvae found in hollows in stems of beech trees.

COLEOPTERA.

W. E. Sharp.

(*British species.*)

Hydradephaga.

Agabus affinis, *Payk.* Coll. J. James. A water beetle rare in Britain, of discontinuous but generally northern distribution. It occurs at Esher, and has probably flown thence to Kew.

Brachelytra.

Tachyporus solutus, *Er.* Coll. H. Downer. Generally common in moss, &c. in Britain.

Philonthus fimitarius, *Gr.* Coll. H. Green. A very common and widely distributed species in refuse of various kinds.

Trogophloeus pusillus, *Gr.* Coll. H. St. J. Donisthorpe. This small beetle has probably flown to the propagating pits, where it was found, from the bank of the river, its natural habitat being the muddy margins of ponds or rivers.

Clavicornia.

Choleva tristis, *Panz.* Coll. J. W. Judd. A common speci e The larvae feed on the dried remains of carrion, skin, bones, &c.

Lamellicornia.

Geotrupes spiniger, *Marsh.* Coll. J. D. Snowden. Common everywhere in the dung of herbivorous animals and familiar to many non-entomologists as the beetle who "wheels his droning flight" in country lanes on summer evenings.

Melolontha vulgaris, *F.* Coll. H. Green. The common Cockchafer. To find this insect in the imaginal state in March is quite abnormal and due probably to the forcing effect of the temperature of the fern house. The larvae feed underground in the roots of various plants.

Cetonia aurata, *L.* Coll. B. Alloway. The common and beautiful "rose chafer." The larvae feed in the decayed wood of standing trees and the beetle is often found in roses in gardens.

Serricornia.

Niptus crenatus, *F.* Coll. H. Downer. Common in shops, warehouses, &c., where it feeds on decaying grain and seeds.

Lyctus brunneus, *Steph.* In Timber Museum. Coll. W. Dallimore. Bores into wood, in this case of *Terminalia*.

Rhyncophora.

Otiorrhynchus sulcatus, *F.* Coll. R. A. Dummer. Generally common and often injurious to Delphiniums and Chrysanthemums in gardens.

(Exotic species.)

Bruchus chinensis, *L.* Coll. J. H. Holland.
In seeds of *Phaseolus lunatus* from Manchuria.
Several species of this large genus have now been found in the houses at Kew, imported in seeds. The larvae bore into and devour seeds of various plants—principally leguminous—and are carried by commerce about the world. They are exceedingly destructive, and whole cargoes of beans and peas are sometimes ruined by their depredations. Some of these Kew specimens from the interior of Africa still await identification or possible description.

HYMENOPTERA.

Formicidae (Ants).

H. St. J. Donisthorpe.

Since the last list of ants found at Kew was published (*K.B.* 1909, p. 250), we have had quite a number of additions, some of them being of considerable interest. Before giving the new list it is worth while to make a few remarks on some of the older or longer established species.

Prenolepis braueri, sub. sp. **donisthorpei**, *Forel*, is as abundant as ever in the Fern House, and I captured a ♂ for the first time last year. This form has been long established at Kew ; I find I took specimens of it as far back as 1896.

Technomyrmex albipes, *Smith*, the most abundant species at Kew, occurs as usual in numbers in the Palm House where the winged and ergatoid ♂♂ were also abundant. One ♂ with very short wings is of considerable interest.

Wasmannia auro-punctata, *Roger*. A number of young of a coccid of the genus *Dactylopius* was found in a nest of this species, and the little spider *Diblemma donisthorpei*, Cambr., frequently occurred in company with this little ant.

The following are all new species to the Kew published lists.

Ponerinae.

Ectatomma regularis, *Mayr*. In propagating pits. Coll. H Downer. Two ☿ ☿. Probably from Mexico.

Ponera opaciceps, *Mayr*. In propagating pits. Coll. J. Sparrow. Two ☿ ☿. A species from Central America.

Myrmicinae.

Monomorium destructor, *Jerdon*. Coll. C. P. Raffill. Many specimens (☿ ☿) living and dead were taken on a plant from Calcutta. The ☿ ☿ in this pretty little species vary considerably in size. It is a cosmopolitan ant.

Pheidole gertrudae, *Forel*. In propagating pits. Coll. H. Downer. ♀ winged, ☿ ☿ minor and major (☿☿). This species comes from Brazil—Rio de Janeiro, &c.

Pheidologeton diversus, *Jerdon*. In fern pits. Coll. J. Christie. Deälated ♀ and ☿ ☿ minor. The ♀ which is enormous in size, especially in comparison with the very small ☿ ☿, was found in the soil in the bottom of a pot. The species occurs in India, Java, &c.

Tetramorium guineense, *Fab.* Mr. Crawley and I found ♀♀ and ☿ ☿ in some numbers of this ant in one of the small houses near the Orchid Houses last December. It is a cosmopolitan species. It was first found in Britain in 1866.

Tetramorium magitae, *Forel*. Coll. C. P. Raffill. ☿ ☿ taken on a plant from Java. This species has recently been described by Prof. Forel from Ceylon.

Dolichoderinae.

Tapinoma melanocephalum, *F.* ☿ ☿ of this very small ant were taken by C. P. Raffill. It is a cosmopolitan species of tropical origin. Although it has not been published in the Kew lists heretofore, it was recorded by Billups on a palm in the Palm House in 1886. (Trans. Ent. Soc. Lond. 1887, p. xxvii.)

Camponotinae.

Prenolepis vividula, *Nyl.*, sub. sp. **antillana,** *Forel.* I have found ☿ ☿ of this sub-species for some years now in the Palm House. It has been recorded incorrectly as the sub-sp *donisthorpei* of *P. braueri* which is only found in the Fern House. It may be known from the latter by its somewhat larger size and its partly red colour, whereas the former is all black.

Camponotus abdominalis, *Roger*, sub-sp. **stercorarius,** *Fab.* A ☿ of this large ant was taken by F. G. Cousins on a clump of imported *Laelia Gouldiana* in the Orchid House. I have had a ♀ and several ☿ ☿ of this race sent to me alive, taken on bananas at Clifton.

Lasius niger, *L.*, sub-sp. **latioides,** *Emery*, ♀. In Orchid House. Coll. C. H. Harris.

I must again thank Professor Forel for kindly naming some of the above species for me.

Apidae (Bees).

Andrena fulva, *Schrank.* The common species usually nesting on lawns, &c., and throwing up little pyramids of sand.

Anthophora filipes, *F.*

Bombus terrestris, *F.*

Bombus hortorum, *Linn.*

Vespidae (Wasps).

Vespa vulgaris, *Linn.* Coll. W. Dallimore. The common wasp, found nesting in a tree in A.; usually builds underground.

Odynerus callosus, *Thoms.* In fern pits. Coll. T. G. Bullock. A solitary wasp which stores its cells with caterpillars.

O. parietum, *Linn.* In temperate house pits. Coll. W. Davies. A solitary wasp.

Tenthredinidae (Sawflies).

Nematus lacteus, *Thomson.* Coll. W. Dallimore. Feeds on willows and the larvae congregate upon the leaves on which they feed. The common gall-forming sawfly of the willow is *N. gallicola.*

Ichneumonidae (Ichneumon-flies).

Ichneumon stramentarius, *Gr.* Coll. H. Green. Found dormant in peat in winter.

I. confusorius, *Grav.* Coll. C. P. Raffill. A species parasitic chiefly on the *Noctuae.*

Chrysididae (Ruby-wasps).

Ellampus auratus, *Linn.* Coll. M. Free. Found throughout all Europe, and the most abundant of the family.

ARACHNIDA.

Rev. O. Pickard-Cambridge, M.A., F.R.S., &c.

Since the publication of my last communication (*K.B.* 1909, pp. 246–250), additions to the list of Arachnids are but few, one only (*Bathyphantes explicata*, sp. n.) being, presumably, indigenous. Among the most frequent of the *Araneidea* sent to me have been *Hasarius adansonii*, Sav., and *Theridion tepidariorum*, C. L. Koch. The former is a conspicuous spider, very active and no doubt easily seen by the employès in the gardens, by whom the collections have chiefly been made, and the latter is found in every plant house almost in the kingdom, in corners and windows, and now and then in the open grounds among plants, &c. Both species are cosmopolitan, and the latter may almost be considered a British spider.

ARANEIDAE.

British species.

Theridiidae.

Bathyphantes explicata, *Cambr.*, sp. n. Coll. in 1898.

Adult male length rather less than 1 line.

Cephalothorax oval, slightly rounded before, considerably longer than broad, lateral impressions at caput very slight; the profile line is distinctly hollow from the eyes to the beginning of the hinder slope.

Eyes of hinder row in a very nearly straight line; the two centrals largest and rather nearer together than each is to the hind-lateral eye on its side, and the interval between the hind-centrals is rather less, or not more, than half a diameter. The fore-centrals are smallest, seated on a strong prominence, and with the hind-centrals form an oblong whose fore-extremity is shortest. Each lateral pair is also seated on a tubercular prominence. The height of the clypeus is half, or a little less than half, of the facial space and projects a little at its lower margin. The colour of the cephalothorax is pale dull yellowish-brown; the normal lines and indentations are indicated by darker brown.

The *falces* are moderate in length and strength, of normal form and similar in colour to the cephalothorax.

Legs, 4, 1, 2, 3; 4 and 1 nearly equal and of moderate length. A few slender spines on the tibiæ (none on the metatarsi), of the 1st and 2nd pairs; colour similar to, or perhaps, rather paler than the cephalothorax.

Palpi like the legs in colour; the cubital and radial joints short; the former shortest, and the latter much the longest, and produced in front on the upper side, both at its fore-extremity as well as underneath, and at each fore-corner is a prominent point or projection, the outer one being the most prominent, and truncate at its extremity, the inner one, when looked at in profile, curved and pointed. The cubital joint has a single tapering slightly sinuous, slender bristly hair projecting forwards. The digital joint is rather

large, slightly prominent near its base ; the palpal organs are complex, and require drawings to give a correct idea of their structure.

Abdomen oval, and of normal form ; its colour is a uniform blackish-brown, and it is thickly furnished with short fine hairs.

I have lately found the specimen above described among some other small spiders received from Kew in 1898 but overlooked ; it differs in the form of the radial joint of the palpus, from any other species of the genus known to me, but there is nothing in either the form or structure of this spider to make me doubt its being an indigenous species, and not to have been imported from any foreign parts. I hope to give some figures in a future paper in Proc. Dors. Nat. Hist. and Antiq. Field Club.

(*Exotic Species.*)

THERAPHOSIDAE.

Bolostromus suspectus, *Cambr.*, sp. n. In soil from Uganda. Coll. H. Green.

Female, immature, length 3½ lines.

Cephalothorax narrow oblong-oval, truncate in front, lateral impressions at caput very slight, the profile at caput gently but not greatly elevated above the thorax in a slightly convex curve. Colour dull pale yellowish-brown, the marginal line dark brown, and the normal indentations are marked with indistinct brownish lines. The thoracic indentation is rounded and its convexity directed backwards.

The *falces* are moderate in length and strength, and slightly projecting forwards, with several strongish tooth-like spines at their fore extremity on the upper side. The fangs are directed obliquely inwards.

Legs moderately long and strong, apparently 1,4,2,3, of a pale dull yellowish colour, the first pair suffused with blackish-brown. The spines beneath the tarsi and metatarsi of the first and second pairs are long but not very strong ; those on the third and fourth pairs are stronger. Beneath the tarsi of the first pair the spines are in two longitudual rows.

Maxillae short, strong, and obliquely truncate. *Labium* longer than wide, its sides sub-parallel, and rather narrowest at the apex, which is slightly hollow-truncate ; these parts are of a pale yellow-brown hue. *Sternum* oval, longer than broad and truncate at its fore-extremity ; its colour is a pale whitish-yellow, and it is covered thickly with bristly hairs.

Abdomen elongate-oval, of a purplish-brown colour above, and dull pale yellowish beneath. The spinners are four in number ; those of the superior pair 3-jointed, of moderate length ; those of the inferior pair close in front of the others.

The *eyes* are unequal in size, in two sub-quadrate groups of four each, or in two transverse lines near together. The outer eyes of the anterior row are the largest, and much larger than the two intermediate ones, these last being also rather larger than the two intermediate eyes of the posterior row. Each lateral pair is seated on a slight tubercular eminence.

Three examples were found among soil received from Uganda. The immaturity of these specimens makes it impossible to speak with certainty as to their species. I have, however, thought it worth while to name it provisionally, and to describe it shortly, so as to assist in the identification of any other examples that may occur in the gardens, and I hope to give some figures of it in my next report in Proc. Dors. Nat. Hist. and Antiq. Field Club.

The distribution of the genus *Bolostromus*, Simon, as at present known, is South and East Africa and South America.

Dysderidae.

? **Orchestina dubia**, *Cambr.*, sp. n. Coll. H. St. J. Donisthorpe. Female adult, length ½ lin.

Cephalothorax longer than broad ; of an oval form, blunt-pointed at its anterior extremity ; the lateral impressions at the caput are very slight, clypeus prominent ; a slight impression in profile between the caput and thoracic junction ; colour brownish-yellow, strongly marked on the margins, and along the normal indentations with converging linear markings of black-brown, and a large irregular triangular patch of the same colour close behind the caput.

The eyes are six in number, rather large, about equal in size, somewhat in the form of a semi-circle, the convexity directed forwards. The four anterior eyes form a nearly straight transverse line, and are contiguous to each other ; the two centrals oval ; behind each of the lateral eyes of this line is another eye on a tubercle, contiguous, and apparently the largest of the six. The eyes of the two lateral pairs are white, those of the central pair of a dark smoky hue.

The *falces* are tolerably strong, straight, conical. *Maxillae* rather strong, tapering, and strongly inclined over the *labium*, which appeared to be broader than long and pointed at its apex.

Sternum round-oval, broader than long, the hinder part slightly produced, and truncate. This part, as also the maxillae and labium, are yellow-brown suffused with black-brown.

Legs.—These were all wanting, excepting one of the fourth pair, which was slender, of moderate length and of a brownish-yellow colour.

The *palpi* appeared to have no terminal claw, and the cubital is longer than the radial joint.

The *abdomen* is of large size, of a short-oval form, very convex above, and broadest behind ; its colour is a dull brown, the underside darker. The form of the epigyne appeared to be a simple transverse cleft. The additional spiracular openings could not be satisfactorily seen.

I have placed this spider provisionally in the genus *Orchestina*, Simon, from which however it appears to differ in some of its characters, though perhaps not generically. A single example only was received, and that one much mutilated. A perfect specimen, and especially one of the male sex, would no doubt make its position more certain.

There was no clue as to whence it may have come to the Royal Botanic Gardens, but it is no doubt an exotic form.

Drassidae.

Corinna praestans, *Cambr.*—Proc. Dors. Nat. Hist. and Antiq. Field Club. 1911. Vol. xxxii, p. 37, pl. A., figs. 1–5.

In Propagating pits. Coll. J. Sparrow and H. T. Mason.

This is a fine and distinct species; received from Kew in July, 1910, and November, 1910, and described and figured (l.c. supra) as new to science. It is, no doubt, an imported spider, but there was no clue as to whence it may have come. The genus has a very wide distribution in exotic regions.

Phalangidea.

I have received from Kew, on various occasions, examples of one, if not two, exotic Phalangids, which however I have not yet been able to identify satisfactorily. They are still under examination.

ACARIDEA.

Gamasidae.

Uropoda obscura, *Koch.* In propagating pits. Coll. J. Scott. Found in tubers of *Raphionacme utilis* from Angola.

ANNELIDA.

Oligochaeta.

Rev. Hilderic Friend.

Since my last list was published (*K.B.* 1910, pp. 79–82), I have been able to add somewhat to our knowledge of the Annelids of Kew. I have, as in former years, had the kind assistance of the staff, and aided by a Government grant, have been able also personally to visit the Gardens and explore the rubbish heaps, loam, lake and ponds. It may be mentioned that on June 8th, 1910, Mr. D. Hillard collected a hair-worm, usually known as *Gordius aquaticus*. The British species of these parasites have not yet been worked out, but I have much material on hand which will receive attention in due course.

My records are chronological.

Allolobophora caliginosa, *Savigny.* Propagating pits. Coll. H. Downer.

The consignment also contained a worm which proved to be a new species, and an interesting addition to science, viz.:—

Aporrectodea similis, *Friend.* Propagating pits. Coll. H. Downer. This worm is about 7 cm. in alcohol, and has a total of 180 segments, of which 5 to 8 are the largest. It exudes very little mucus or turbid fluid, the male pores on segment 15 are not on prominent papillae, the girdle extends from 28 to 35, and the tubercula pubertatis are on the alternate segments 30, 32, 34.

Trigaster minima, *Friend.*

Fridericia peruviana, *Friend.*

Coll. H. Downer. In a Wardian case from Peru. The earth received was kept for some time under examination, with the result that these two additions were made to our list. They appear also to be new to science, and a full description of these new species will appear in suitable publications as occasion serves.

At the end of August, 1911, I visited the Gardens. The intensely dry summer made it difficult to obtain larger forms, but I was able to discover one or two new species of earthworm, and confirm some of the earlier records. The most interesting point lay in the re-discovery of the new *Aporrectodea*. I also found a new form of *Eisenia rosea* which may prove, when further material comes to hand, to be entitled to rank as a new species. My list contains the following unrecorded species.—

Eisenia rosea, *Savigny*. Type and var. **Macedonica**, *Rosa*, *A. alpestris*, Bretscher.

Allolobophora icterica, *Savigny*.

Octolasium cyaneum, *Savigny*.

The loam and vegetable mould was very dry, but I was fortunately able here to obtain some valuable material. In the loam I found four species of Enchytraeids, one of which seems to me to be new to science, while one has never before been recorded for England, though it has been found in Ireland. One is also important on account of its association with the sickness of asters and other plants.

Achaeta bohemica, *Vejdovsky*. The first English record.

Enchytraeus argenteus, *Mich.*, *E. parvulus*, Friend. The aster worm.

Fridericia bisetosa, *Levinsen*.

Fridericia pulchra, *Friend*. New to science.

The lily ponds and lake were carefully examined, and material was brought from the Lily house. Unfortunately some of this material became putrid, and I was unable to identify certain species of fresh-water worms which it contained. I was able, however, to determine the species of *Limnodrilus* formerly reported, and to add the following to the list.—

Tubifex tubifex, *Müller*.

Limnodrilus hoffmeisteri, *Clap.*

Limnodrilus udekemianus, *Clap.*

Stylodrilus vejdovskyi, *Benham.*

Limnodrilus aurantiacus, *Friend.*

The latter is a very small *Limnodrilus* new to Britain, and to science. A full diagnosis will appear elsewhere.

Limnodrilus papillosus, *Friend*, also new to science, was found.

Dero obtusa, *D'Udek.*

Paranais naidina, *Bretscher*. New to Britain.

FLORA.

Rosaceae.

Rubus Idaeus, *L.* In an enumeration of the Rubi growing indigenously at Kew, it was remarked (*K. B.*, 1909, p. 370), that a few clumps of *Rubus Idaeus*. L., recorded as growing in the Queen's Cottage grounds by the late Mr. G. Nicholson, "now seem to have disappeared ; at all events we could not find any." A large clump of it has since been pointed out to me by Mr. C. P. Raffill, which leaves only *R. macrophyllus*, Weihe & Nees, unaccounted for, and this may well be due to a change of name in such a critical group.

R. A. R.

Gramineae.

Cynodon Dactylon, *Pers.* Occurs abundantly in the turf to the west of the new range.

Selaginellaceae.

Selaginella denticulata, *Link.* Coll. Sir A. H. Church. Growing by a clump of *Saxifraga caespitosa* over rocks in Rock garden.

ALGAE.

Cyanophyceae.

Aphanizomenon Flos-aquae, *Ralfs.* At the end of August, 1911, the water of the pond by the Museums was noticed to have a peculiar greenish hue and to be opaque. This appearance was found to be due to the presence of innumerable spindle-shaped blue-green bodies floating and suspended in the water, the spindles being as much as $\frac{1}{4}$–$\frac{1}{2}$ in. long. The spindle-shaped bodies are formed of bundles of filaments of *Aphanizomenon Flos-aquae*, a species not previously recorded from Kew. In other years this pond has presented a similar appearance to that described above, but due to another "blue-green" alga *Clathrocystis aeruginosa*, Henfrey (see *K. B.* Add. Series, v, p. 208). In July, 1908, the water of the pond was pea-green in colour owing to the dense mass of this alga, and it was also seen in quantity in 1909 and 1910. During the present year, however, it has not been noticed, and the *Aphanizomenon* appears to have taken its place.

The sudden appearance of these algae is known in some parts as "the breaking of the meres," and an interesting note on the subject was published by W. Phillips in Grevillea, vol. ix (1880–81), pp. 4–5, with plate. The alga mentioned in this note is *Anabaena circinalis*, Rabh. An allied species *Anabaena Flos-aquae*, Bréb., is known at Kew (see *K. B.*, l.c., p. 210), and sometimes occurs in considerable abundance.

Microcoleus paludosus, *Gomont*, common at the sides of the paths near main entrance in spring. *A. D. C.*

Lyngbya perelegans, *Lemm.* On submerged stones in stream in Rock garden. *L. A. B.*

FUNGI: FOURTH SERIES.

G. Massee.

Since the publication of the last list in *K. B.*, 1909, pp. 373–376, the following additional species have been recorded :—

Agaricaceae.

Pholiota blattaria, *Fr.* Q.

Naucoria horizontalis, *Bull.* On twig. Q.

Coprinus fimetarius, var. **macrorhizus**, *Fr.* On horse-dung. *E. M. W.*

Tremellineae.

Tremella viscosa, *B.* On rotton wood. Q. *E. M. W.*

Pyrenomycetes.

Cordyceps entomorrhiza, *Fr.* Coll. J. W. Judd. On larva of *Ocypus olens*, in soil ; Temperate House pits.

Cordyceps entomorrhiza.

Nectria sanguinea, *Fr.* On dead branches. Q. *E. M. W.*

Hypomyces aureo-nitens, *Tul.* On old *Stereum hirsutum*. Q.

Dothidea genistae, *Wint.* On *Genista tinctoria*.

Cucurbitaria Spartii, *De Not.* On *Ulex europaea*. A.

Ophiobolus porphyrogonus, *Sacc.* Forming dull reddish stains on dead nettle-stems. Q. *E. M. W.*

Discomycetes.

Helotium calyculus, *B.* On Horse-chestnut husks.

Scleroderris livida, *Mass.* On Redwood twigs.

Onygena equina, *Pers.* On an old sock.

Onygena corvina, *A. & S.* On skeleton of some bird. Q.

Deuteromycetes.

Discosia Artocreas, *Fr.* On dead herbaceous stems.

Libertella alba, *Lamb.* On *Genista tinctoria*, var. *elatior*. A.

Rhinotrichum lanosum, *Cooke.* Forming pale ochraceous woolly tufts on a damp plaster wall. *E. M. W.*

Periconia byssoides, *Pers.* On dead stems of *Urtica*. Q. *C. O. F.*

Stachylidium cyclosporum, *Grove.* On rotten wood. Q. *E. M. W.*

Dendryphium comosum, *Wallr.* On dead stems of *Urtica*. Q. *E. M. W.*

Sporodesmium chartarum, *B. & C.* On damp plaster wall. *E. M. W.*

Dictyosporium elegans, *Corda.* On dead palm leaf. Q. *E. M. W.*

Volutella nivea, *Sacc.* On an old *Scleroderma vulgare*. Q.

LII.—MISCELLANEOUS NOTES.

Mr. C. O. Farquharson, B.Sc., of the University of Aberdeen, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Mycologist in Southern Nigeria.

Pencil Cedar.—In a recent letter to the Commissioner of Agriculture for the West Indies Mr. J. C. Moore, Agricultural Superintendent for St. Lucia, reports the discovery of a juniper from the Petit Piton in that island. Some 14 years ago he had been informed by Mr. Evelyn, then Chief Clerk at the Government Office at St. Lucia, that a coniferous tree was found on the top of this Piton and that it was the Pencil Cedar. It was, however, not until quite recently that Mr. C. Devaux succeeded in securing specimens from that almost inaccessible locality. There are, according to him, only half-a-dozen trees there and they are stunted by wind. The altitude of the station where the tree grows is given as 2460 feet. A fruiting specimen, together with a section of a branch to show the wood, have been received at Kew from the Commissioner of Agriculture. The tree proves to be *Juniperus barbadensis*, L., a species closely allied to *J. virginiana*, L., and *J. bermudiana*, L., with both of which it is frequently confused, as has been pointed out by Professor Sargent (Sylva of N. America, xiv., p. 89, t. 738). The area of this tree on the continent is distinctly littoral, extending on the Atlantic Coast from Southern Georgia to about 27° N. lat. in Florida, and on the Gulf Coast of Florida from about 27° to 30° N. lat., but it also includes a number

of widely scattered stations in the West Indies, as the Bahamas, San Domingo, and the Blue Mountains of Jamaica, as well as St. Lucia. In Barbados it was in existence at least until 1830, when Maycock (Flora Barbadiensis, p. 395), recorded it from there as a "by no means common tree." Since that time it has not been mentioned as occurring in the island. In the Blue Mountains of Jamaica it is now rare, and ranges from 3500–6000 feet; in San Domingo it was found at 5000 feet, and in St. Lucia, as stated above, at 2460 feet. These mountain stations evidently represent only the last remains of a former much wider vertical range in the islands, where, as in Florida, the tree was much sought for on account of its highly priced wood.

O. S.

A Hybrid Heath.—An interesting specimen of a heath has been received from Mr. P. D. Williams, who collected it on moorland near Lanarth, St. Keverne, Cornwall. Its characters appear to point to its being a hybrid between *Erica tetralix*, L., and *E. vagans*, L. The chief points of resemblance and difference in the three plants are enumerated below, and the anatomical characters of the supposed parents and hybrid have also been examined.

Erica tetralix, L. Stems wiry, with elongate, straggling, pubescent or tomentose and sometimes glandular branches. Leaves in whorls of four, oblong or oblong-ovate, 3 mm. long., 0·5–1 mm. broad, white below, with revolute margins which are clothed with glandular hairs often 0·5 mm. long. Flowers in reduced lateral racemes, of from 1 to 3 flowers, which are clustered at the end of the central axis and so form a false umbel. Sepals lanceolate, the margins covered with long glandular hairs. Corolla oval-urceolate, 7 mm. long, pale rose in colour, with shortly triangular, reflexed teeth. Stamens included in the corolla; anthers yellow, the lobes united and with two appendages at the base. Style exserted. Ovary often pubescent.

Erica vagans, L. Stems stout with stiff, erect, glabrous branches. Leaves in whorls of four, linear, 6 mm. long and about 0·5 mm. broad, flat above, convex below with a deep furrow, margins not revolute, and without glandular hairs. Flowers in racemes of 3 to 5 flowers, the racemes being arranged on a long central axis which is usually terminated by leaves. Sepals ovate and minutely ciliate. Corolla campanulate, widely open at the mouth at the time of flowering, 3·5–4 mm. long, pink in colour, and with four rather large erect segments. Stamens projecting a quarter of their length from the corolla; anthers dark brown, lobes separate from the base, and without appendages. Style exserted. Ovary glabrous.

Erica vagans × *tetralix*. Stems straggling with slightly pubescent branches. Leaves crowded on the branches in whorls of four, linear-oblong, 4–5 mm. long and 0·75–1 mm. broad, flat above, slightly convex below with a conspicuous furrow, margins not revolute, with very short glandular hairs. Flowers arranged in lateral racemes which sometimes arise from a long central axis terminated by leaves, but sometimes are condensed and situated

near together at the apex of the axis. Sepals ovate-lanceolate, minutely ciliate, and sometimes with a few, very short, glandular hairs. Corolla campanulate, open at the top, 4 mm. long, pink in colour, with four erect segments. Stamens included in the corolla ; anthers nearly as in *E. vagans* but smaller, the lobes being divided from the base, having no appendages and being dark brown in colour. Style exserted. Ovary minutely pubescent.

The only hybrid heath previously recorded from Cornwall is *E. Watsoni*, Benth. (in DC. Prod. vii. 665), a hybrid between *E. ciliaris* and *E. tetralix*. In Davey, Flora of Cornwall, p. 282, this plant is recorded from many localities in the two botanical districts of "North Coast" and "Fal."

W. B. T.

A comparison of the hairs and internal tissues of the leaf has been made in *E. vagans*, *E. tetralix*, *E. ciliaris* and the supposed hybrid *vagans* × *tetralix*. The following characters, which were noted in the specimens examined, do not carry much weight, but appear to suggest *E. tetralix* and *E. vagans* as parents.

The glandular hairs of Mr. Williams' plant are of the same type as those of *Erica tetralix*, but are much shorter. Glandular hairs are not present in *E. vagans*.

The heads of the glandular hairs are broader in the hybrid and in *E. tetralix* than in *E. ciliaris*. The amount of sclerenchyma accompanying the median vascular bundle is greater in the hybrid and in *E. tetralix* than in *E. ciliaris* and *E. vagans*. The upper surface of the leaf (disregarding the apex, margin and base), may bear a fair number of scattered clothing hairs in the hybrid. On the same part of the leaf, hairs are numerous in *E. tetralix*, absent or practically absent in *E. vagans* and *E. ciliaris*.

In the hybrid heath the clothing hairs on the petiole and margin of the leaf are short, and thus suggest *E. ciliaris* rather than *E. tetralix*, but this character may be due to the influence of *E. vagans*, in which these hairs, where present, are very short.

The anthers are like those of *E. vagans*, and the pollen, or at any rate some of it, is bad.

L. A. B.

Botanical Magazine for October.—The plants figured are *Lissochilus stylites*, Reichb. f. (t. 8397) ; *Aphelandra fascinator*, Linden and Andre (t. 8398) ; *Spiraea Wilsoni*, Duthie (t. 8399) ; *Rhododendron ambiguum*, Hemsl. (t. 8400) ; and *Buddleia officinalis*, Maxim. (t. 8401).

The *Lissochilus* resembles several of its congeners in having large and showy rose-purple flowers, and is nearest allied to *L. arenarius*, Lindl., but is considerably larger in all its parts. The type specimen was collected in the Monbuttu Country, South Central Africa. The species has since been obtained from Angola, and the material for the present plate was furnished by a plant received from Ikom on the Cross River, Southern Nigeria, by the Hon. Mrs. Foley, in whose collection at Packham, Fordingbridge, Hants, it flowered in June, 1909.

Aphelandra fascinator is aColombian species which has been in cultivation since 1873, having been introduced by Mr. J. Linden. The leaves are attractive as well as the dense spikes of brilliant scarlet flowers, and as the latter are freely produced during the winter months we have in this Acanthad a particularly useful plant for the warm moist greenhouse.

Spiraea Wilsoni has been introduced into cultivation by Messrs. J. Veitch & Sons, and the material for the figure was supplied by them from one of the original plants growing in their Coombe Wood Nursery. A native of Central China it is closely allied to *S. Henryi*, Hemsl. (t. 8270 of the Botanical Magazine) and *S. Veitchii*, Hemsl. (t. 8383), both also Chinese species which closely resemble the more familiar Himalayan *S. canescens*, D. Don. *S. Wilsoni* has rather small leaves, which are often 3-toothed at the apex, and rounded corymbs of small white flowers terminating the short branches.

The *Rhododendron* is a new species which Messrs. Veitch have obtained from Western China. It is probably most nearly allied to the Himalayan *R. triflorum*, Hook. f., and is chiefly interesting on account of its yellow flowers.

Buddleia officinalis is very similar to the now well-known *B. variabilis*, Hemsl., of which several fine forms have been introduced into gardens by Messrs. Veitch. It differs in having the corolla pubescent outside, and also in the character of the tomentum on the underside of the leaves. The specimen figured was obtained from a plant raised from seed presented by Professor Sargent of the Arnold Arboretum, to which establishment it had been sent by Mr. E. H. Wilson from the Yang-tze valley. The species is also found in the provinces of Shensi and Kansu, and its flower-buds are collected and carried to Hankow, where they are sold as a medicine.

Botanical Magazine for November.—The plants figured are *Caladium pubescens*, N. E. Br. (t. 8402); *Rhododendron japonicum*, Schneider, var. *pentamerum*, Hutchinson (t. 8403); *Leonotis dysophylla*, Benth. (t. 8404); *Phyllodoce amabilis*, Stapf (t. 8405); and *Ruellia Devosiana*, Morren (t. 8406).

Caladium pubescens is a new species introduced from Peru by Messrs. Sander & Sons, who presented to Kew the plant from which the material for the figure was obtained. It is remarkable in having leaves, peduncle and spathe clothed with pubescence, an unusual condition in the genus and indeed in the order.

The *Rhododendron* is an attractive pink-flowered plant and a new variety, which differs from the typical form in having a 5-lobed corolla, 10 or 11, instead of 14 stamens, and a 5-celled ovary. Like the type it is Japanese, and the plant which furnished the specimen figured was imported from Tokyo in 1894.

The genus *Leonotis* has been represented in gardens for about a century by the brilliant-flowered *L. Leonurus*, R. Br., and this species, a native of South Africa, is probably the best of the genus for the horticulturist. *L. dysophylla* has broader leaves than

L. Leonurus and differs in the dentition of the calyx. It is found in the Transvaal, Orange River Colony, Transkei, Griqualand East and Natal. The illustration was prepared from a specimen sent to Kew in January last by the Curator of the Cambridge Botanic Garden, who received seeds from Mr. G. Thorncroft, Barberton, Transvaal.

Phyllodoce amabilis is a new species allied to *P. empetriformis*, A. Gr., and *P. intermedia*, A. Gr., from both of which it may be distinguished by its campanulate instead of urceolate corolla. It is almost certainly native either of the Rocky Mountains or of the Cascade Range, and has been in cultivation at Kew for some years.

Ruellia Devosiana is Brazilian, and was introduced by Messrs. Jacob-Makoy of Liége in 1875. The plant which furnished the material for the figure was received from the Jardin des Plantes, Paris, in 1903. Through rather insignificant in its flowers it has decorative leaves, and is suitable as a trailer or basket-plant for the warm greenhouse.

The Reclamation of Sand Dunes.—In 1909 the New Zealand Government issued a report by Dr. L. Cockayne on the sand dunes of the Dominion. That report (see *K.B.*, 1910, p. 99) dealt especially with the formation and movements of dunes, and of their ecological botany. The subject of dune-reclamation was reserved for a future occasion.

A further and complete report on the subject has now been issued.* The geological and botanical descriptions given in the previous account are extended, and form part i of the present treatise, whilst dune-reclamation forms the subject of part ii.

It is pointed out by Dr. Cockayne that the final object of reclamation should be the improvement of the sand-areas as a whole through their occupation by a continuous plant-covering that shall be of commercial value; but before this goal is reached several stages must be passed, the first of which is the checking of moving and encroaching sand. The experience gained in Europe as well as in other countries shows that the most efficacious sand-binding plant is undoubtedly the marram grass (*Ammophila arenaria*), and that for fixing drifting sand it cannot be beaten. Where there is no drift, or where there is a well fixed marram-area to windward, the tree lupin (*Lupinus arboreus*) is highly recommended for use in New Zealand. It is a good sand-fixer, and can be grown in pure sand in practically all parts of the country. Details are given as to the method and cost of marram-planting, and as to the subsequent management of the planted area.

With regard to the establishment of pastures and farm lands on dune areas, the principles to be followed are those which are learned from the ecological study of the sand dunes. In the botanical section of the report, the natural evolution of the fixed sand area from the mobile dune is traced, and it is possible to

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* Report on the Dune-areas of New Zealand, their Geology, Botany and Reclamation, by L. Cockayne. New Zealand, Department of Lands, 1911.

develop artificially a succession of plant-associations which should culminate in a permanent and fairly staple pasture. In the case of afforestation it is only necessary to keep the sand in check till the trees are well established, at which time, if sufficiently close, they will form a perfect shelter to easily blown sand. But in the formation of pastures the case is different. The wind is continually blowing over the surface and opposing the formation of thick turf. The great object, therefore, in pasture-making, after checking moving sand, is to increase the cohesion of the upper sand-layer, and with this in view plants producing the maximum amount of humus should be selected. These may be succeeded by the use of those pasture-plants which form a good permanent turf. A list of the most suitable grasses, clovers, and fodder-plants is provided, together with much valuable information as to planting and treatment in different types of locality.

Whilst the farming of dune-areas is largely practised in New Zealand, afforestation has up to the present hardly been attempted. A number of suggestions however are given. Many trees are known to flourish in pure sand in various parts of the Dominion, and others, such as *Olearia Traversii* and several pines, are capable of resisting salt-gales, and thus may be used for planting close to the shore. Within this shelter-belt, species of acacia, eucalyptus, and other well known sand-tolerating trees and shrubs may be successfully grown. Advice on tree planting and management is tendered, but the author emphasises the need of caution and of further experiment. The report concludes with a list of plants suitable for dune-cultivation in New Zealand, and with a bibliography of 140 titles.

A. D. C.

Trees and Shrubs.—Professor Sargent's monumental work "The Silva of North America," of which the first volume was published in 1891, was concluded in 1902. It comprises 14 handsome quarto volumes illustrated by 740 plates prepared from nature by Mr. C. E. Faxon, and its publishers are Messrs. Houghton Mifflin Company of Boston and New York. Author, artist, printer and all concerned in the production of this work have each aimed at a high standard of bibliographical perfection, with the result that "The Silva of North America" is easily the best work of its kind. Naturally this fine series of volumes is costly and always will be. The publishers' price is $350.

The publication which is the subject of the present note may be regarded as supplementary to the "Silva." Its full title is: "Trees and Shrubs: Illustrations of new or little known Ligneous Plants, prepared chiefly from material at the Arnold Arboretum of Harvard University and edited by Charles Sprague Sargent." It is quarto in size and is issued in parts, each containing 25 plates with descriptive text, four parts forming a volume. The first part was published in November 1902, and the third part of the second volume, issued in June of the present year, has, like the preceding, reached Kew from Messrs. Houghton Mifflin Company, the publishers of the work. The price of each part is $5 net. The excellent drawings (uncoloured) are prepared by Mr. C. E. Faxon,

"Trees and Shrubs" includes not only North American woody plants, but new or little known species from other regions, especially those likely to flourish out of doors in the United States and Europe, and others possessing particular commercial value.

The editor has secured the collaboration of several specialists the chief of whom, from his numerous contributions, is Mr. Alfred Rehder, who is responsible for the text accompanying 85 out of the 175 plates so far published.

Prof. Sargent supplies the text to 70 plates, 42 of which are given to *Crataegus*, all but one being new species. This genus, which appears to be so extraordinarily variable in North America, has during the last 15 years received a great deal of attention from American botanists, particularly from Mr. C. D. Beadle, Mr. W. W. Ashe and Prof. Sargent. Previous to 1896 the total number of species generally recognised amounted to less than 70, including 14 from North America. Since, and chiefly during the last few years, new species have been created in hundreds, the precise number of American species described since 1896 being 922. Writing on "The genus *Crataegus* in North America" (Journal of Botany, 1907, p. 289) Prof. Sargent does not support the theory that the many forms of the genus in North America are hybrids of recent origin. Many seedlings have been raised in the Arnold Arboretum and they do not show the tendencies to variation usually found in the offspring of recent hybrids. They do not vary in foliage, flowers or fruit, and Prof. Sargent has never seen what seemed to him to be a hybrid *Crataegus*. He finds that the time of flowering, number of stamens, colour of anthers, time of ripening and the nature of the fruit, and the form of the nutlets, are constant and can be depended on as distinguishing characters.

At t. 51 a figure is given of the Chinese Tulip Tree which the editor describes under the name of *Liriodendron chinense*. It was formerly regarded as a variety of *L. Tulipifera*, but it differs in the flowers, which are not more than half as large, with much narrower petals, and in the elongated fruit-cone and the shape of the inner carpels. This plant is especially interesting since it forms another connecting link between the floras of Eastern North America and Eastern Asia. The genus as now understood contains only 2 species, one from each of the regions named. It is shown that formerly *Liriodendron* was widely spread over North America and Europe.

The small genus *Hamamelis* is similarly interesting. Until very recently only 3 species (or 4 if *H. arborea*, Masters, is held to be distinct from *H. japonica*) were known: *H. virginiana*, L., which is widely distributed in Eastern North America, *H. japonica*, Sieb. & Zucc., from Japan and the Province of Kiangsi, Central China, and *H. mollis*, Oliv., from Central China. In the last part of "Trees and Shrubs" (t. 136, p. 137) Prof. Sargent figures and describes a second American species under the name of *H. vernalis*. This is recorded from Missouri, Arkansas and Oklahoma. A specimen with fragmentary flowers from Texas probably belongs to the same species.

Ulmus japonica, Sargent (t. 101) is based on *U. campestris* var. *japonica*, Rehder (var. *laevis*, Fr. Schmidt). It resembles both *U. americana*, Linn. and *U. campestris*, Linn.

Mr. Rehder has described numerous species of *Viburnum*, (25 figured), *Acer* (17 figured), *Lonicera* (12 figured) and of other genera including *Cornus*, *Euonymus* and *Malus*. *Picea morindoides*, Rehd. (t. 48), a species allied to *P. Alcockiana*, Carr., is known only in a cultivated state. The original tree grows in the arboretum of Mr. G. Allard at Angers. At p. 175 of vol. i., Mr. Rehder gives a conspectus of the sections and species of *Acer* of Eastern Continental Asia. This is followed by an enumeration which includes 44 species, many of which have been introduced into cultivation by Messrs. James Veitch & Sons, and the Director of the Arnold Arboretum. The genus *Viburnum* has been similarly dealt with in vol. ii. p. 105. Mr. Rehder's enumeration includes 65 species from Eastern Asia. The species of *Lonicera* figured are mainly Chinese.

Mr. J. M. Greenman has founded two new genera. *Faxonanthus* (t. 12) is a shrubby plant belonging to the *Scrophulariaceae* and allied to *Leucophyllum*. *F. Pringlei*, the only species, is based on Pringle's No. 8594, collected near Tehuacan, Mexico. *Grypocarpha* (t. 73) is a glabrous much-branched shrubby monotypic Composite, whose nearest ally is *Heliopsis*. It also is Mexican, *G. Nelsoni* having been discovered in the State of Chiapas by E. W. Nelson.

The Pines, of which 4 are figured, including *Pinus Altamirani*, n. sp. (t. 99) and *P. Pringlei*, n. sp. (t. 100), from Uruapan, Mexico, are described by Mr. G. R. Shaw, the author of "The Pines of Mexico," a thin quarto volume containing 22 plates by Mr. Shaw himself, which was issued in March, 1909, as "Publications of the Arnold Arboretum No 1." A copy of this work, which has every appearance of being well done, has been presented to Kew by Prof. Sargent. *Pinus terthrocarpa*, Shaw (t. 75 of "Trees and Shrubs") is based on *P. cubensis* var.? *terthrocarpa*, Griseb.

The genus *Dracaena* till recently was known only from the Old World. A species most nearly allied to *D. Draco*, Linn., of the Canary Islands, has now been discovered in Central America where it is widely distributed. A figure of this interesting plant is given at t. 98, and is described by Mr. J. Donnell Smith as *D. americana*. The species is in cultivation at the New York Botanic Garden.

Other contributors to "Trees and Shrubs" are Miss Alice Eastwood, who describes two new species of *Arctostaphylos* from California, *A. virgata* (t. 96) and *A. vestita* (t. 97); Mr. M. L. Fernald, the author of two new species from Mexico, *Ehretia viscosa* (t. 13) and *Solanum molinum* (t. 49); and Prof. B. L. Robinson, who has of late years given much attention to the *Eupatorieae*, supplies the text to (t. 9) *Eupatorium Loesenerii*.

Taxonomists are deeply indebted to Prof. Sargent for the wealth of information on ligneous plants which in his various fine works he has rendered accessible to them. In "Trees and Shrubs" the same high character which distinguishes all the publications with which his name is associated as author or editor is maintained, and we trust that for many years to come he will be able and willing to continue it.

S. A. S.